Abstract

The largest segment of the Neoproterozoic Mozambique belt in Kenya occurs east of the north-south oriented Rift system. Geological works carried out in the country during the last few decades have progressively revealed the complexity of the geology, structures and tectonics of the Mozambique belt in the region. Important high grade tectono-thermal events in the belt took place between about 845 and 715 Ma. The tectonothermal events attained P/T conditions of 5.5 - 7.1 kbars and 500 - 750o C. The subsequent cooling and uplift of the basement has been traced by K-Ar dates on biotites, which range between 528 and 438 Ma. New lithological units established in the last two decades include widespread granitoid, anorthositic, gabbroic to ultramafic intrusions and limited andesitic volcanics in the central region of this eastern segment of the Mozambique belt (EMBS). Previously the geology of this central region had been considered to consist predominantly of pelitic and semi-pelitic schists and gneisses, migmatites and amphibolites. Further north in the Chanler's Falls and Archer's Post areas, this segment is dominated by paragneisses and schists, marbles and calc-silicate rocks, granulites, as well as metamorphosed mafic and ultramafic rocks. A similar lithological metamorphic assemblage as the one in the north is repeatedly noted in the southern part of the belt. Here in the Taita Hills region, close to the Tanzanian border, paragneisses, marbles, amphibolites and metamorphosed ultramafic rocks, with ophiolitic signatures are widespread. West of the Taita Hills in Kajiado district, quartzites are an additional rock unit while meta-ultramafic rocks are notably absent. Complex folding, exhibiting at least three fold generations, and which occasionally have formed elliptical dome and basin structures, are widespread. These are particularly common in the central region of the EMBS. The entire segment however, has several Neoproterozoic faults, thrust and shear zones, some of which are of regional dimensions. For example, the Yatta shear zone, extending for over 300 km in a NW-SE direction, obliquely subdivides this segment into two. Cenozoic reactivation of some of the fault and shear zones is quite evident. Petrography coupled with limited geochemical analyses indicate the probable existence of Neoproterozoic island arcs in the central region of this segment. In particular, while the sequences in the northern section of the EMBS indicate an ophiolitic- midocean ridge- to island arc setting, the central section show an affinity ranging from volcanic arc- calc-alkaline volcanic arc- to within-plate volcanics setting. The southern section of the EMBS indicate a setting sequence ranging from continental shelfophiolitic sature - midocean ridge – within plate to subduction related volcanics and island arc setting. The sequences in the nothern and southern sections of the belt are interpreted to be parts of the previously deep marine “proto Mozambique ocean” prior to the protracted Mozambique orogenic event. Some of the shallow marginal zones of this ocean are likewise inferred to have been in the west, where extensive quartzite horizons are presently found. The authors strongly recommend a more enhanced multi-disciplinary study of the EMBS in Kenya.